Remarks

Applicants have received and reviewed the Office Action mailed December 5, 2001. By way of response, Applicants have canceled claim 3 without prejudice, amended claims 1, 4-6, 8, 10, 17, and 19, and present new claims 20-42. Claims 1, 4-10, and 17-42 are now pending. No new matter is introduced. Applicants submit that the amended and newly presented claims are supported by the specification.

Applicants appreciate and acknowledge the withdrawal of rejections under 35 U.S.C. § 103.

For the reasons given below, Applicants respectfully submit that the amended and newly presented claims are in condition for allowance, and notification to that effect is earnestly solicited.

Petition for Extension of Time

It is noted that a three-month petition for extension of time is necessary to provide for timeliness of the response. A request for such an extension is made extending the time for response from March 5, 2002 to June 5, 2002.

35 U.S.C. § 112, First Paragraph Rejections

The Examiner rejected claims 1, 3-10 and 17-19 under 35 U.S.C. § 112, first paragraph. The Office Action asserts that the claims must be limited to certain amino acid substitutions in certain structural features of the SPE-C molecule. Claim 3 has been canceled, rendering this rejection moot for this claim. Although this rejection has not been raised for the newly presented claims, it is discussed insofar as it might apply. Applicants respectfully traverse this rejection.

Newly Presented Claims 20-42

The Office Action objected to claims that recite six amino acid substitutions or that recite substitutions in secondary structural regions. It appears from the Office Action that claims reciting exemplified embodiments of the present SPE-C mutants might be allowable.

Claims 20-42 recite SPE-C toxins including one, two, or three amino acid substitutions. The dependent claims recite specific, exemplified substitutions.

Claims 34-42 recite only substitutions at positions shown in the examples to provide desirable properties for the SPE-C mutants. The dependent claims recite specific, exemplified positions and substitutions.

Accordingly, it is believed that claims 20-42 do not include any of the recitations objected to in the Office Action.

Claims 1, 4-10, and 17-19

Applicants maintain that the facts, authority, and reasoning presented in their submissions mailed February 26, 2001 and September 17, 2001 address the Examiner's comments regarding claims 1, 4-10, and 17-19.

Applicants respectfully request that the Examiner reconsider the rejection of claims 1, 4-10, and 17-19 in light of the support in the present specification. The specific factual support found in the specification was pointed out at pages 5-6 of the Amendment & Response mailed February 26, 2001 and at pages 1-6 of the Preliminary Amendment mailed September 17, 2001. Specific experimental examples supporting the claims are found in the present application.

Applicants read the current rejection as requiring that the claims be limited to only the exemplified embodiments. Authority found in the MPEP and the case law, which applicant has pointed out in the parent application and which should be well known to the Examiner, indicate that it is inappropriate to limit an invention to exemplified embodiments, particularly when the application factual support supporting broader claims.

The MPEP address the severity of limiting claims to exemplified embodiments:

In In re Goffe, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976), the court stated:

> [T]o provide effective incentives, claims must adequately protect inventors. To demand that the first to disclose shall limit his claims to what he has found will work or to materials which meet the guidelines specified for "preferred" materials in a process such as the one herein involved would not serve the constitutional purpose of promoting progress in the useful arts.

M.P.E.P. at 2164.08.

The MPEP notes that limiting an inventor to claims to preferred materials or what the inventor has found will work does not serve the constitutional purpose of promoting progress in the useful arts. In the present case, Applicants have exemplified several nonlethal mutants of SPE-C, have

explicitly described various amino acids that are preferred sites for making such mutants, and specifically describe secondary structural features that are suitable locations for mutations eliminating toxicity. By the standard expressed in In re Goffe and in the MPEP at 2164.08, constitutional purposes would be defeated by limiting the inventor to the specifically disclosed mutants of SPE-C. Thus, the inventors are entitled a generic claim including all of these mutants of SPE-C.

Conclusion

Accordingly, it is submitted that claims 1, 4-10, and 17-42 fully comply with § 112, first paragraph, and withdrawal of this rejection is respectfully requested.

Summary

In summary, Applicants assert that each of claims 1, 4-10, and 17-42 are in condition for allowance, and notification of that effect is earnestly solicited.

The Examiner is invited to contact Applicants' undersigned representative at the telephone number provided below, if the Examiner believes that doing so will expedite prosecution of the application.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903
(612) 332-5300

Date: June 5, 2002

Mark T. Skoog

Mark T. Skoog
Reg. No. 40,178
MTS:sab

MARKED-UP VERSION TO SHOW CHANGES MADE

1. (Twice Amended) A mutant Streptococcal pyrogenic exotoxin type C (SPE-C toxin):

the mutant comprising an amino acid substitution [in a β-barrel of a B-subunit or a N-terminal alpha helix wherein the mutant has at least one amino acid change and is substantially nonlethal compared with a protein substantially corresponding to wild type SPE-C toxin] at aspartic acid-12, tyrosine-15, tyrosine-17, histidine-35, asparagine-38, or substitution at more than one of these amino acids.

4. (Twice Amended) The mutant SPE-C toxin of claim [3] 1, wherein the [at least one] amino acid substitution comprises:

the substitution of aspartic acid-12 to alanine, glutamic acid, asparagine, glutamine, lysine, arginine, serine, or threonine;

the substitution of tyrosine-15 to phenylalanine, alanine, glycine, serine, or threonine;

the substitution of tyrosine-17 to phenylalanine, alanine, glycine, glutamic acid, lysine, arginine, aspartic acid, serine, or threonine;

the substitution of histidine-35 to phenylalanine, alanine, glycine, glutamic acid, lysine, arginine, aspartic acid, tyrosine, phenylalanine, serine, or threonine; [or]

the substitution of asparagine-38 to alanine, aspartic acid, glutamic acid, lysine or arginine; or

substitution at more than one of these amino acids.

5. (Twice Amended) The mutant SPE-C toxin of claim 4, wherein the [at least one] amino acid substitution comprises:

the substitution of aspartic acid-12 to alanine,

the substitution of tyrosine-15 to alanine,

the substitution of tyrosine-17 to alanine,

the substitution of histidine-35 to alanine, [or]

the substitution of asparagine-38 to aspartic acid; or

substitution at more than one of these amino acids.

6. (Amended) The mutant SPE-C toxin of claim [3] 1, wherein the [at least one] amino acid substitution comprises substitution of tyrosine-15 and asparagine-38.

8. (Amended) The mutant SPE-C toxin of claim [3] 1, wherein the [at least one] amino acid substitution comprises substitution of tyrosine-17 and asparagine-38.

10. (Amended) The mutant SPE-C toxin of claim 1, wherein the mutant has at least one of the following characteristics: the mutant has a decrease in mitogenicity for T-cells, the mutant does not [substantially] enhance endotoxin shock, the mutant is not lethal compared to wild-type SPE-C, or the mutant is nonlethal but retains mitogenicity comparable to that of the wild type SPE-C toxin.

17. (Amended) The mutant SPE-C toxin of claim [3] 1, wherein the [at least] amino acid substitution comprises:

the substitution of tyrosine-15 to alanine or serine;

the substitution of tyrosine-17 to alanine or serine;

the substitution of asparagine-38 to serine or alanine;

the substitution of tyrosine-15 to serine or alanine and of asparagine-38 to serine or alanine;

the substitution of tyrosine-17 to serine or alanine and of asparagine-38 to serine or alanine;

the substitution of aspartic acid-12 to alanine;

the substitution of asparagine-38 to aspartic acid; or

the substitution of tyrosine-15 to alanine, histidine-35 to alanine and asparagine-38 to aspartic acid.

19. (Amended) A mutant SPE-C toxin comprising [one to six amino] acid substitutions[,

wherein] at [least one of the substituted amino acids is] aspartic acid-12, tyrosine-15, tyrosine-17, histidine-35, or asparagine-38[; and

wherein the mutant is substantially nonlethal compared with a protein substantially corresponding to wild type SPE-C toxin].